

CLAIMS:

1. A computer method for adjusting portfolios of fixed income instruments of multiple parties comprising:

5 storing in memory of at least one computer digital data representing portfolio holdings of multiple parties;

storing in the memory of at least one computer digital data representing constraints that define trading requirements of the parties;

10 converting, using at least one computer, the digital data representing the portfolios of multiple parties and the digital data representing the constraints of the multiple parties to optimization digital data adapted for processing by an optimization engine; and

15 optimizing using at least one computer the optimization digital data so as to generate a set of trades among the parties that rebalance the parties' portfolios in accordance with parties' constraints such that the portfolios are substantially optimized with respect to a predetermined objective.

20 2. The method of claim 1 further comprising supplying to the optimization engine digital data representing pricing information for fixed-income instruments of the portfolios, the pricing information being provided by an unbiased source, wherein the unbiased source is not a publicly-available database.

25 3. The method of claim 1 wherein the digital data representing the constraints includes digital data representing user constraints defining relationships between portfolio instruments that should be satisfied in a resultant portfolio produced by the optimization engine during optimizing.

4. The method of claim 3 wherein the user constraints include digital data representing duration neutrality constraints.

5 5. The method of claim 3 wherein the user constraints include digital data representing convexity neutrality constraints.

10 6. The method of claim 3 wherein the user constraints including digital data representing par-value weighted attributes.

15 7. The method of claim 3 wherein the user constraints include digital data representing proceeds bounding within sectors.

20 8. The method of claim 1 wherein the digital data representing the constraints includes digital data representing system constraints stored in the memory.

25 9. The method of claim 8 wherein the system constraints include digital data representing bond conservation constraints.

30 10. The method of claim 8 wherein the system constraints include digital data representing proceeds neutrality constraints.

11. The method of claim 8 wherein the system constraints include mutual exclusion digital data for avoiding churning.

12. The method of claim 8 wherein the system constraints include mutual exclusion digital data for avoiding wash sales.

13. The method of claim 8 wherein the system constrains include digital data for avoiding trading between subsidiaries of the same parent.

5 14. The method of claim 1 further comprising storing digital data representing an objective function for optimization.

10 15. The method of claim 14 wherein the objective function substantially maximizes tax deductions generated by traded participants' portfolios.

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20 16. The method of claim 14 wherein the objective function substantially maximizes a total book loss in participants' portfolios.

17. The method of claim 14 wherein the objective function includes data representing economic value of tax deferral.

20 18. A computer method for adjusting portfolios of fixed income instruments of multiple parties, comprising:

25 storing in memory of at least one computer digital data representing portfolio holdings of multiple parties, the multiple parties comprising two or more affiliated parties, the portfolio holdings comprising at least one fixed income instrument held by at least one of the two or more affiliated parties;

30 storing in the memory of at least one computer digital data representing constraints that define trading requirements of the parties, the defined trading requirements comprising distinct trading requirements for each of the two or more affiliated parties;

35 converting, using at least one computer, the digital data representing the portfolios of multiple parties and the

digital data representing the constraints of the multiple parties to optimization digital data adapted for processing by an optimization engine; and

optimizing using at least one computer the optimization digital data so as to generate a set of trades among the parties that rebalance the parties' portfolios in accordance with parties' constraints such that the portfolios are substantially optimized with respect to a predetermined objective;

wherein the digital data representing the constraints includes digital data representing system constraints stored in the memory, and wherein said system constraints comprise constraints designed to reduce the likelihood of trades between the two or more affiliated parties.

19. The method of claim 18, wherein:

if the at least one fixed income instrument is not held by any party other than the two or more affiliated parties, then said system constraints comprise a constraint that prevents the two or more affiliated parties from buying the at least one fixed income instrument, and

if the at least one fixed income instrument is held by at least one party other than the two or more affiliated parties, then said system constraints comprise a constraint that requires the amount of the at least one fixed income instrument bought by the two or more affiliated parties to be less than the amount of the at least one fixed income instrument sold by all parties other than the two or more affiliated parties.

20. The method of claim 18 wherein the predetermined objective is programmed as an objective function.

21. The method of claim 18 further comprises supplying to the optimization engine digital data representing pricing information for fixed-income instruments of the portfolios, the pricing information being provided by an unbiased source, wherein the unbiased source is not a publicly-available database.

22. The method of claim 18 wherein the step of optimizing comprises computer processing of a linear programming problem.

23. The method of claim 18 wherein the step of optimizing comprises computer processing of a mixed integer programming problem.

24. The method of claim 18 wherein the step of converting further comprises converting digital data stored in the memory representing portfolio and constraint data into a matrix digital data suitable for processing by the optimization engine.

25. The method of claim 18 wherein the digital data representing the constraints includes digital data representing user constraints defining relationships between portfolio instruments that should be satisfied in a resultant portfolio produced by the optimization engine during optimizing.

26. The method of claim 25 wherein the user constraints include digital data representing duration neutrality constraints.

27. The method of claim 25 wherein the user constraints include digital data representing convexity neutrality constraints.

28. The method of claim 25 wherein the user constraints including digital data representing par-value weighted attributes.

5 29. The method of claim 25 wherein the user constraints include digital data representing proceeds bounding within sectors.

10 30. The method of claim 25 wherein the step of converting includes parsing the user constraints and building a data structure stored in memory of at least one computer as a tree data structure.

15 31. The method of claim 18 wherein the system constraints include digital data representing bond conservation constraints.

20 32. The method of claim 18 wherein the system constraints include digital data representing proceeds neutrality constraints.

25 33. The method of claim 18 wherein the system constraints include digital data representing non-negativity and boundedness.

30 34. The method of claim 18 wherein the system constraints include mutual exclusion digital data for avoiding churning.

35 35. The method of claim 18 wherein the system constraints include mutual exclusion digital data for avoiding wash sales.

36. The method of claim 18 further comprising storing digital data representing an objective function for optimization.

5 37. The method of claim 36 wherein the objective function substantially maximizes tax deductions generated by traded participants' portfolios.

10 38. The method of claim 36 wherein the objective function substantially maximizes a total book loss in participants' portfolios.

15 39. The method of claim 38 wherein the objective function includes data representing economic value of tax deferral.

20 40. The method of claim 18 wherein the digital data, stored in computer memory, representing the constraints of multiple participants is organized in accordance with a formal grammar.

25 41. The method of claim 40 wherein the formal grammar includes representation of logical relationships among sectors.

42. The method of claim 40 wherein the formal grammar includes specifying bounded linear constraints.

30 43. The method of claim 42 wherein the formal grammar comprises specifying base attributes and normalization attributes of the constraints.

44. A computer method for adjusting portfolios of fixed income instruments of multiple parties, comprising:

storing in memory of at least one computer digital data representing the portfolios of the multiple parties;

storing in the memory of at least one computer digital data representing constraints that define trading requirements of the parties;

converting, using at least one computer, the digital data representing the portfolios of the multiple parties and the digital data representing the constraints of the multiple parties to optimization digital data adapted for processing by an optimization engine;

supplying first pricing information for the fixed-income instruments in the portfolios of the multiple parties;

optimizing using at least one computer the optimization digital data and the first pricing information so as to generate a first set of trades among the parties that rebalance the parties' portfolios of fixed-income instruments in accordance with the constraints that define trading requirements of the parties such that the portfolios are substantially optimized with respect to at least one predetermined objective;

communicating the first set of trades to each of the multiple parties;

receiving approval of the first set of trades from each of the multiple parties;

supplying second pricing information for the fixed-income instruments in the portfolios of the multiple parties, said second pricing information comprising prices quoted by traders of an intermediary entity that facilitates trades among the parties that rebalance the parties' portfolios of fixed-income instruments; and

optimizing using at least one computer the optimization digital data and the second pricing information so as to generate a second set of trades among the parties that rebalance the parties' portfolios of fixed-income

instruments in accordance with the constraints that define trading requirements of the parties such that the portfolios are substantially optimized with respect to at least one predetermined objective; and

5 executing the second set of trades at the prices quoted by the traders of the intermediary entity.

45. The method of claim 44 wherein the predetermined objective is programmed as an objective function.

10 46. The method of claim 44 wherein the steps of optimizing comprise computer processing of a linear programming problem.

15 47. The method of claim 44 wherein the steps of optimizing comprise computer processing of a mixed integer programming problem.

20 48. The method of claim 44 wherein the step of converting further comprises converting digital data stored in the memory representing portfolio and constraint data into a matrix digital data suitable for processing by the optimization engine.

25 49. The method of claim 44 wherein the digital data representing the constraints includes digital data representing user constraints defining relationships between portfolio instruments that should be satisfied in a resultant portfolio produced by the optimization engine during
30 optimizing.

35 50. The method of claim 49 wherein the user constraints include digital data representing duration neutrality constraints.

51. The method of claim 49 wherein the user constraints include digital data representing convexity neutrality constraints.

5 52. The method of claim 49 wherein the user constraints including digital data representing par-value weighted attributes.

10 53. The method of claim 49 wherein the user constraints include digital data representing proceeds bounding within sectors.

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54. The method of claim 49 wherein the step of converting includes parsing the user constraints and building a data structure stored in memory of at least one computer as a tree data structure.

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55. The method of claim 44 wherein the digital data representing the constraints includes digital data representing system constraints stored in the memory.

56. The method of claim 55 wherein the system constraints include digital data representing bond conservation constraints.

25 57. The method of claim 55 wherein the system constraints include digital data representing proceeds neutrality constraints.

30 58. The method of claim 55 wherein the system constraints include digital data representing non-negativity and boundedness.

59. The method of claim 55 wherein the system constraints include mutual exclusion digital data for avoiding churning.

5 60. The method of claim 55 wherein the system constraints include mutual exclusion digital data for avoiding wash sales.

10 61. The method of claim 55 wherein the system constrains include digital data for avoiding trading between subsidiaries of the same parent.

15 62. The method of claim 44 further comprising storing digital data representing an objective function for optimization.

20 63. The method of claim 62 wherein the objective function substantially maximizes tax deductions generated by traded participants' portfolios.

25 64. The method of claim 62 wherein the objective function substantially maximizes a total book loss in participants' portfolios.

30 65. The method of claim 64 wherein the objective function includes data representing economic value of tax deferral.

66. The method of claim 44 wherein the digital data, stored in computer memory, representing the constraints of multiple participants is organized in accordance with a formal grammar.

67. The method of claim 66 wherein the formal grammar includes representation of logical relationships among sectors.

5 68. The method of claim 66 wherein the formal grammar includes specifying bounded linear constraints.

69. The method of claim 68 wherein the formal grammar comprises specifying base attributes and normalization
10 attributes of the constraints.

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